



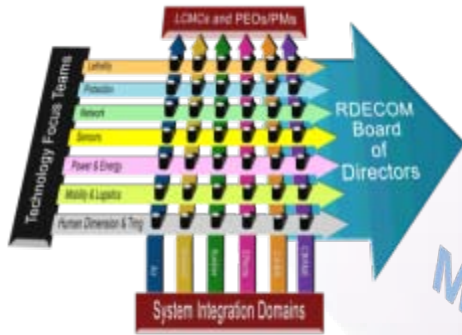
**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**

# RDECOM's Ground Combat Vehicle S&T Support Strategy: An Integrated Approach

Dr. Grace Bochenek  
Director, U.S. Army Tank Automotive Research, Development and Engineering Center  
19 May 2010

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>19 MAY 2010</b>		2. REPORT TYPE <b>N/A</b>		3. DATES COVERED <b>-</b>	
4. TITLE AND SUBTITLE <b>RDECOMs Ground Combat Vehicle S&amp;T Support Strategy: An Integrated Approach</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) <b>Dr. Grace Bochenek</b>				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000, USA</b>				8. PERFORMING ORGANIZATION REPORT NUMBER <b>20842</b>	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) <b>US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000, USA</b>				10. SPONSOR/MONITOR'S ACRONYM(S) <b>TACOM/TARDEC</b>	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) <b>20842</b>	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>The original document contains color images.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>SAR</b>	18. NUMBER OF PAGES <b>17</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

- **Maturing RDECOM's Integration Processes**
- **Taking the Ground Systems Integration Domain to the Next Level**
- **RDECOM Process Adapted to GCV**
- **Support Across the Life Cycle**
  - Pre MS A
  - Aligning the Portfolio Pre PDR
  - Aligning the Portfolio Post MS C
  - Tech Insertion Maturation and Risk Reduction
- **Systems Integration Across the Ground Domain Fleet**



## Continuous Integration Evolution

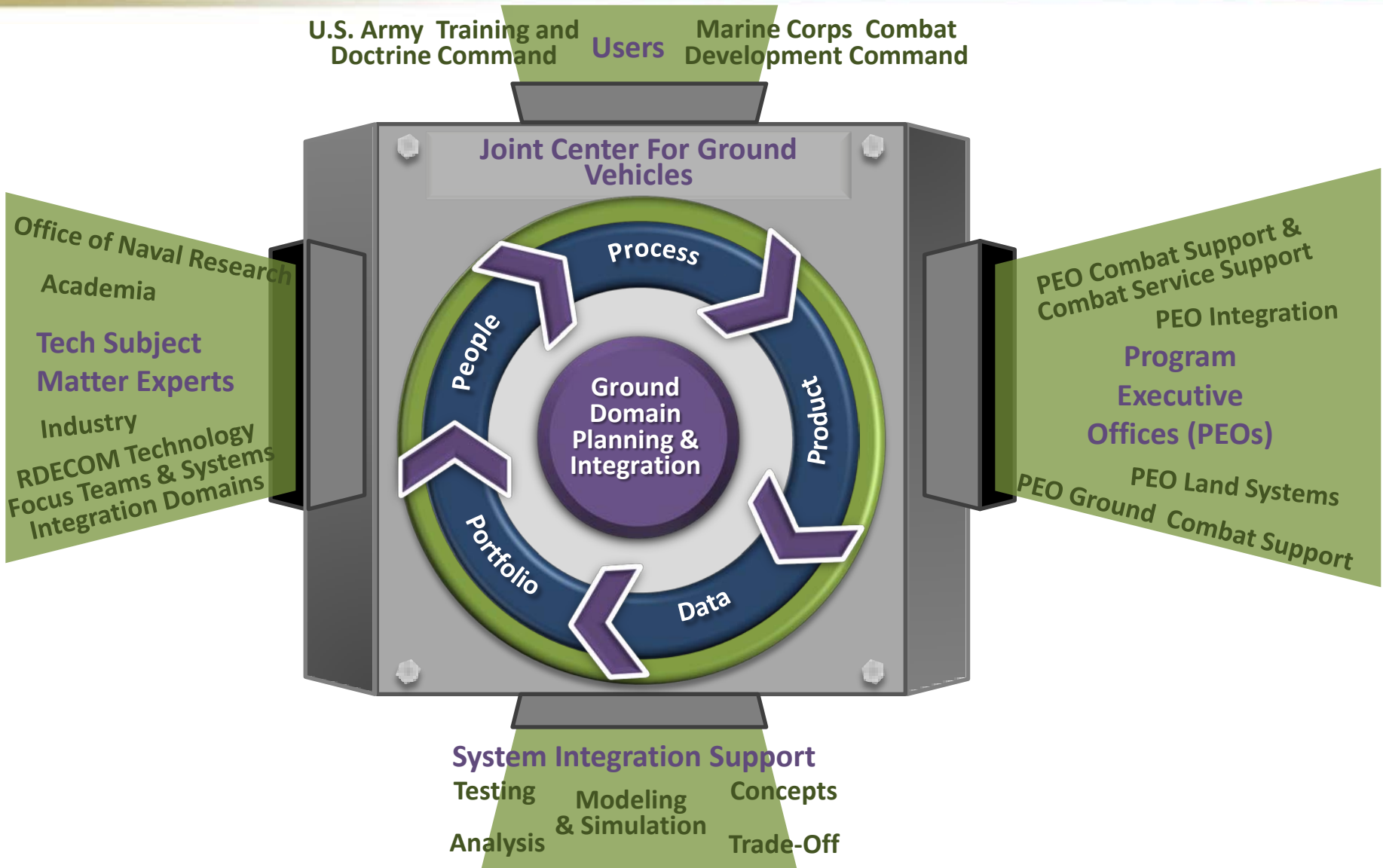
- Technical Expertise
- Processes
- Data
- Products

*Maturity Evolution*

**Ground  
Domain  
Planning &  
Integration**

Joint Center for  
Ground Vehicles

U.S. Army Training and Doctrine Command **Users** Marine Corps Combat Development Command

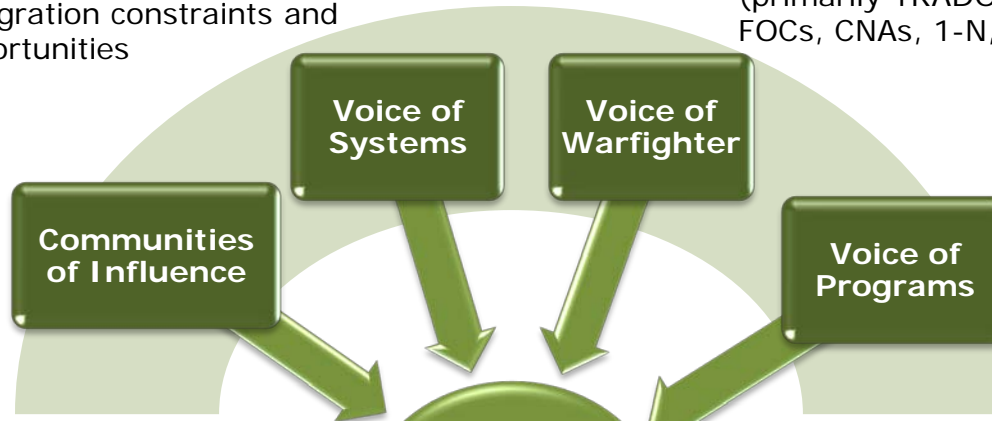


## Information Supports Integrated Decision Making

System Technical Design &  
Integration constraints and  
opportunities

Soldier Needs & Wants  
(primarily TRADOC), WFOs,  
FOCs, CNAs, 1-N, CDDs

Joint Leadership,  
RDECOM, Industry,  
Academia, Innovation,  
Standards & Regulatory



Business parameters:  
cost, schedule,  
performance

**Integrated Capability/Needs Analysis**  
**Integrated Strategic Planning**  
**Integrated Decision Making**  
**Integrated Portfolio Development**

**System Centric Support:**  
**People, Process,**  
**Products, Data, Portfolio**



Resources aligned to  
address needs and  
priorities

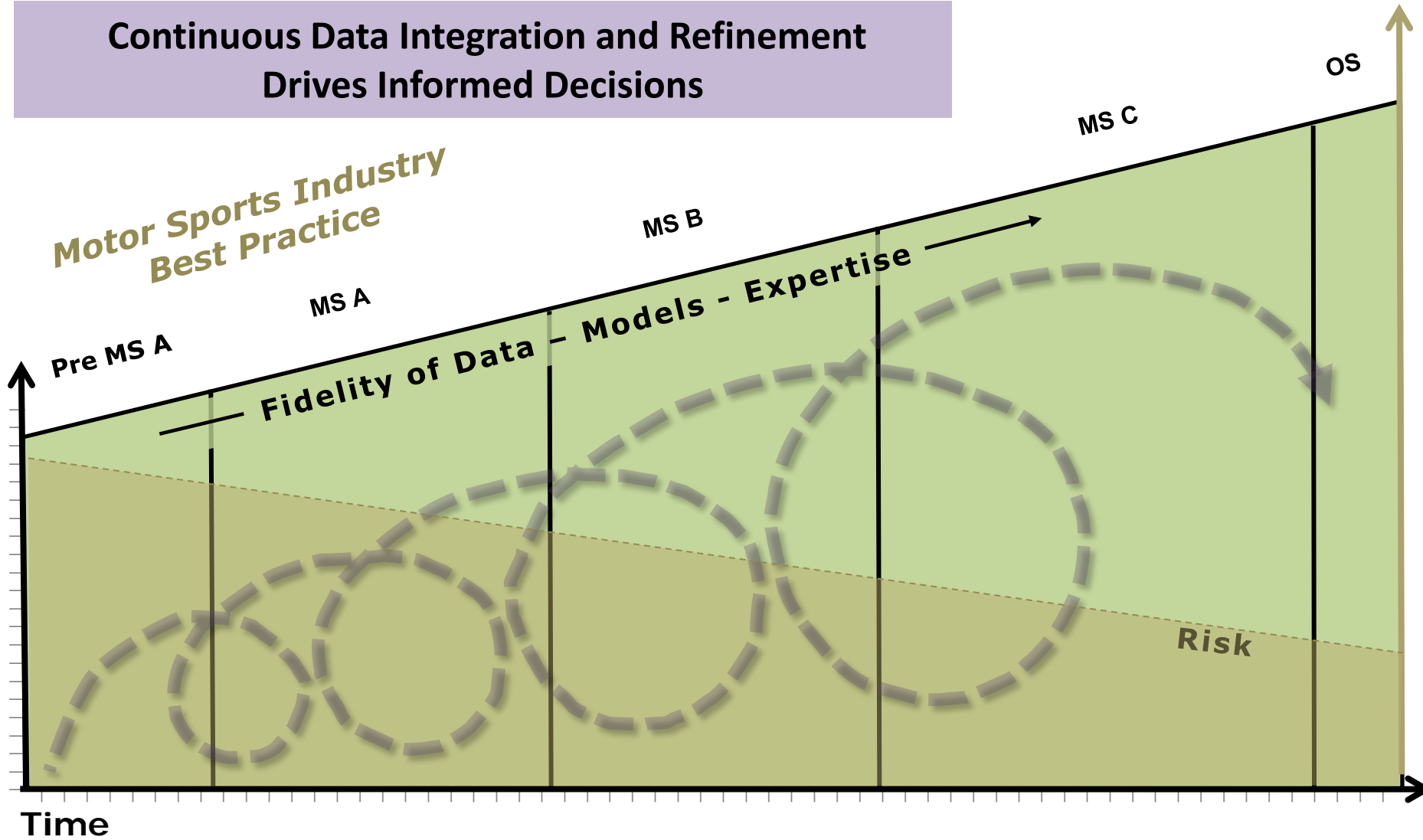
Plans and Programs coordination to  
align with cost, schedule, &  
performance goals

Strategic Relationship  
Management -- RDECOM  
(TFTs & SIDs) and Ground  
Domain Stakeholders shape  
investment strategies

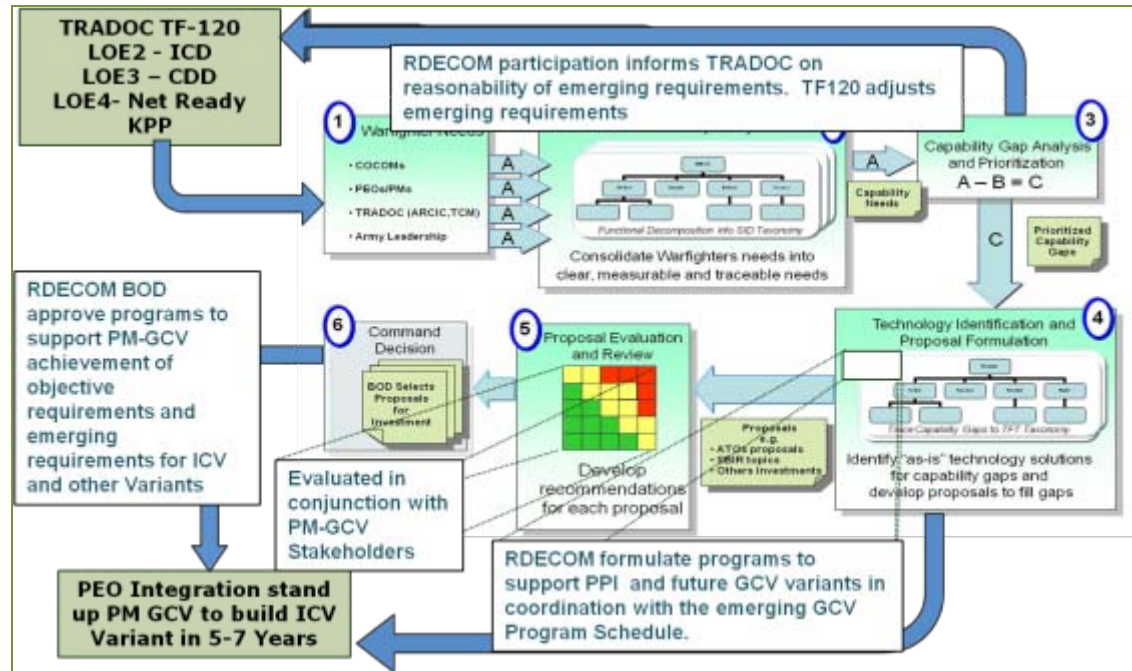
**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**



Continuous Data Integration and Refinement  
Drives Informed Decisions



Building Life Cycle System Knowledge Over Time



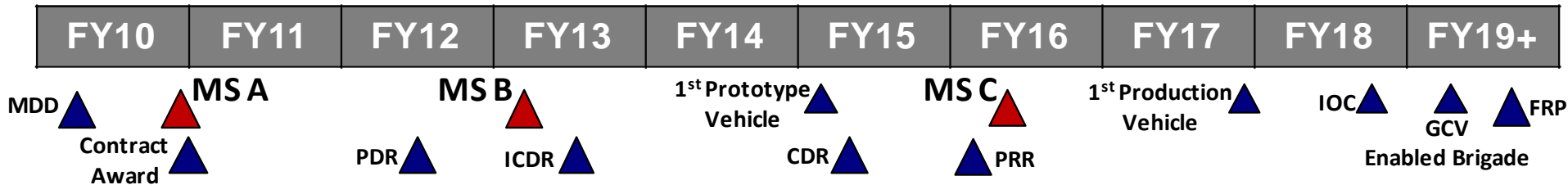
- ✓ Repetitive, Robust Process
- ✓ Methodology to Address Gaps
- ✓ Full Transparency across RDECOM
- ✓ Drives Corporate Decision Making

Supports Building the Portfolio



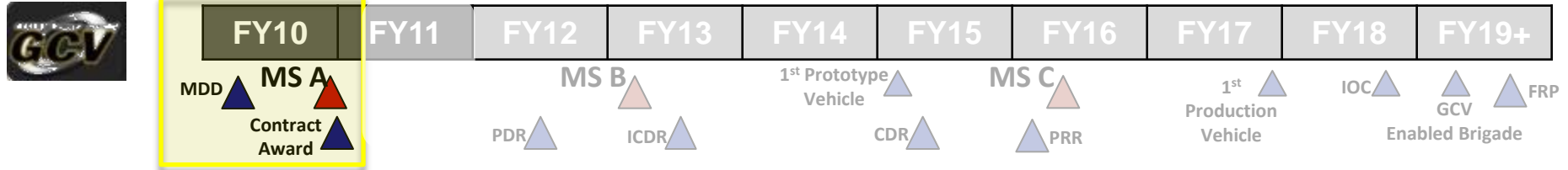
Ground Combat Vehicle has become the first example of the new integrated RDECOM / GSID approach that can support a platform through its Life Cycle

## GCV Program Schedule



Platform Support Across the Life Cycle

## GCV Program Schedule



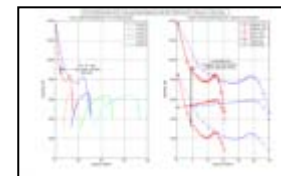
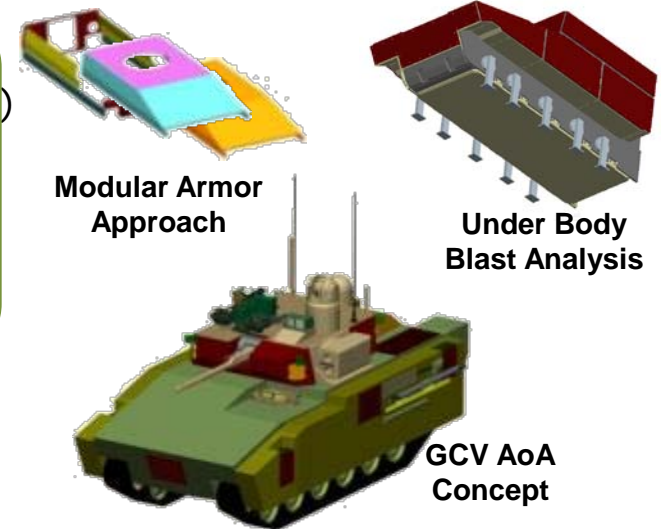
### Task Force 120:

- Successful creation the GCV Requirement Document (CDD)
- Embedded with TRADOC MCOE and Program Office
- Utilizing M&S to quickly iterate requirements
  - Less than 24 hour turn around
- Created GCV CDD in less than 4 months

### Analysis of Alternatives:

RDECOM created GCV Concept as a physical representation of CDD requirements for AoA Analysis

- Provides initial assessment of vehicle SWaP impacts
- Concept supported and matured with the requirements development and refinement process

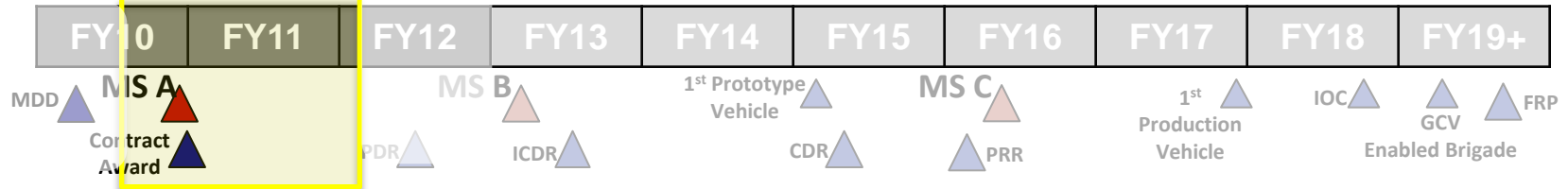


Mobility Analysis



Human Factors Engineering

## GCV Program Schedule



### Portfolio Review:

- Identify Programs Relevant to GCV
- Map Programs to GCV Schedule

### Portfolio Analysis:

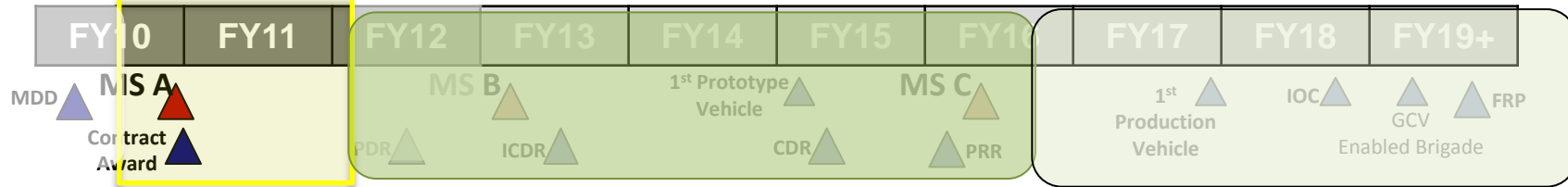
- Prioritize Programs Identified Against GCV Requirements:
  - Tech Maturity Assessment
  - PM Identified Gaps
  - Delivery Timelines
  - Integration Suitability

### Integration Package Development:

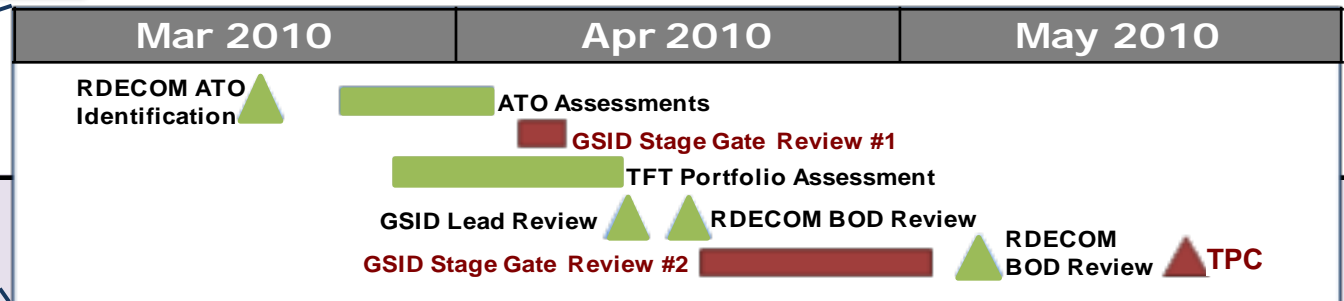
- Combine Related Programs into Integration Packages
- Integration Packages Focus on Merging Individual Technology Efforts into Cohesive System Level Evaluations

**Focusing on combining technology efforts into integration packages**

## GCV Program Schedule



GCV S&T Portfolio Alignment

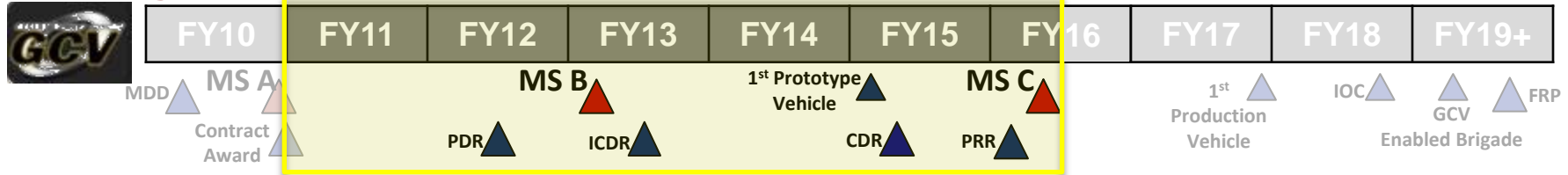


## OUTCOMES:

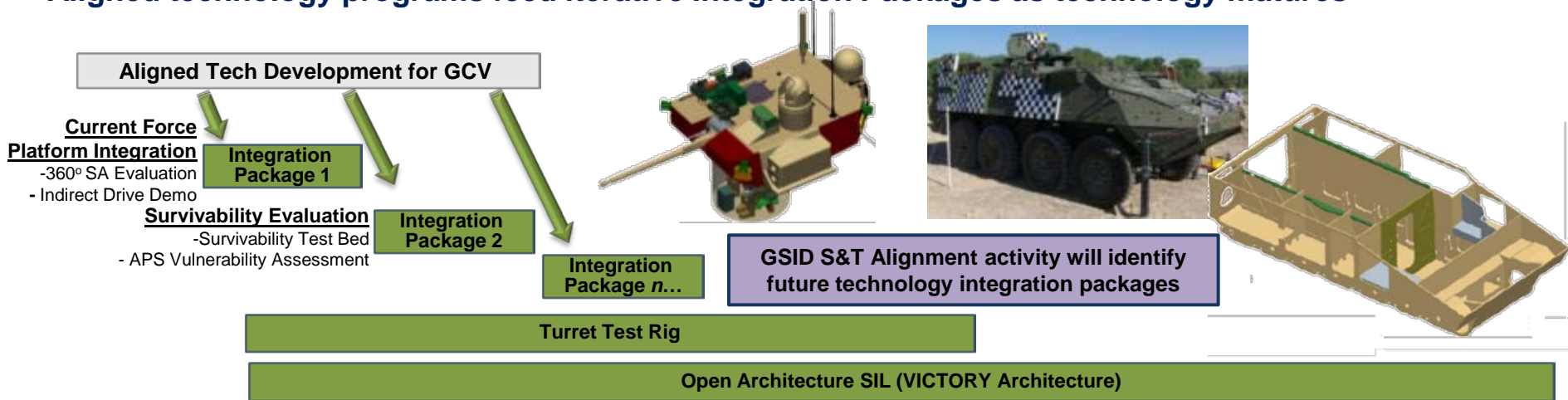


**Alignment has Synchronized Tech Development to Program Timeline**

## GCV Program Schedule



## Aligned technology programs feed iterative Integration Packages as technology matures



### Integration Packages will:

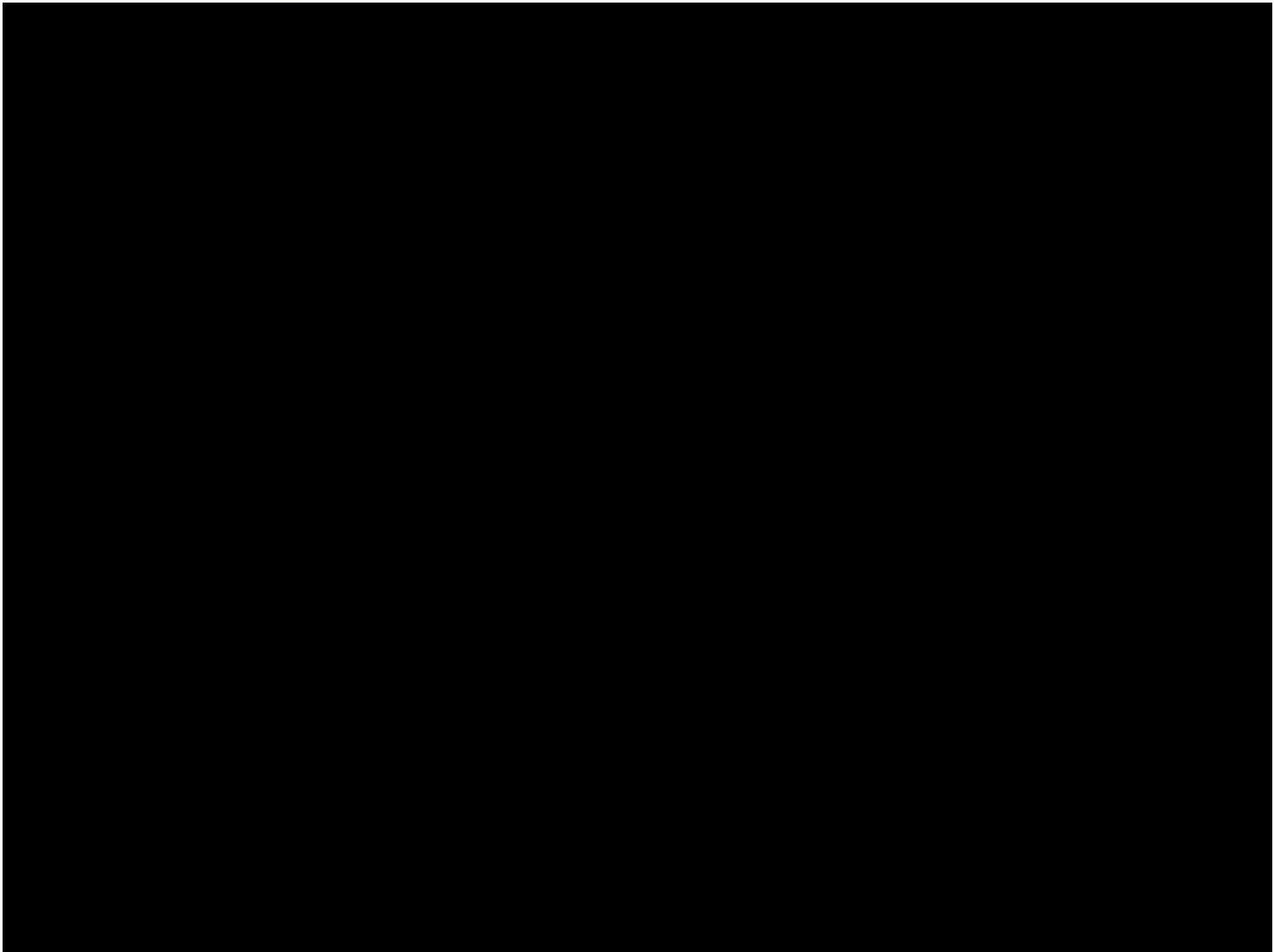
- Inform PM in key risk areas for the program
- Combine multiple related technologies for system level evaluations
- Build integration expertise across RDECOM
- Create system test fixtures to facilitate future integration opportunities







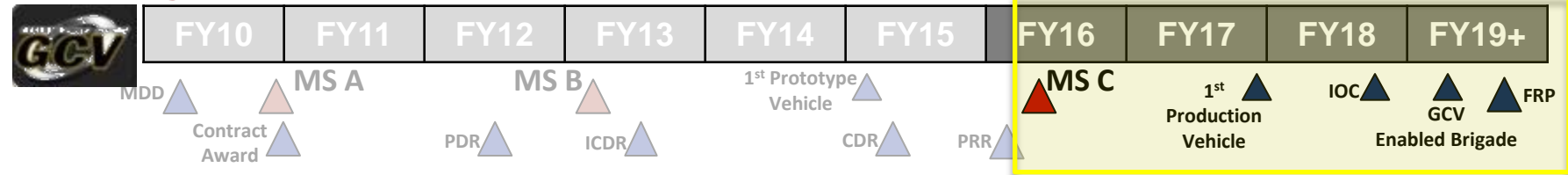
# Survivability Integration Demonstration



**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**



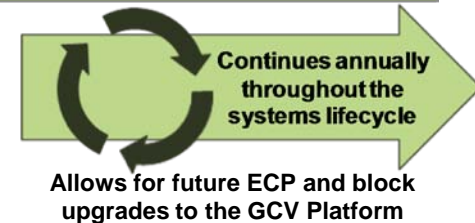
## GCV Program Schedule



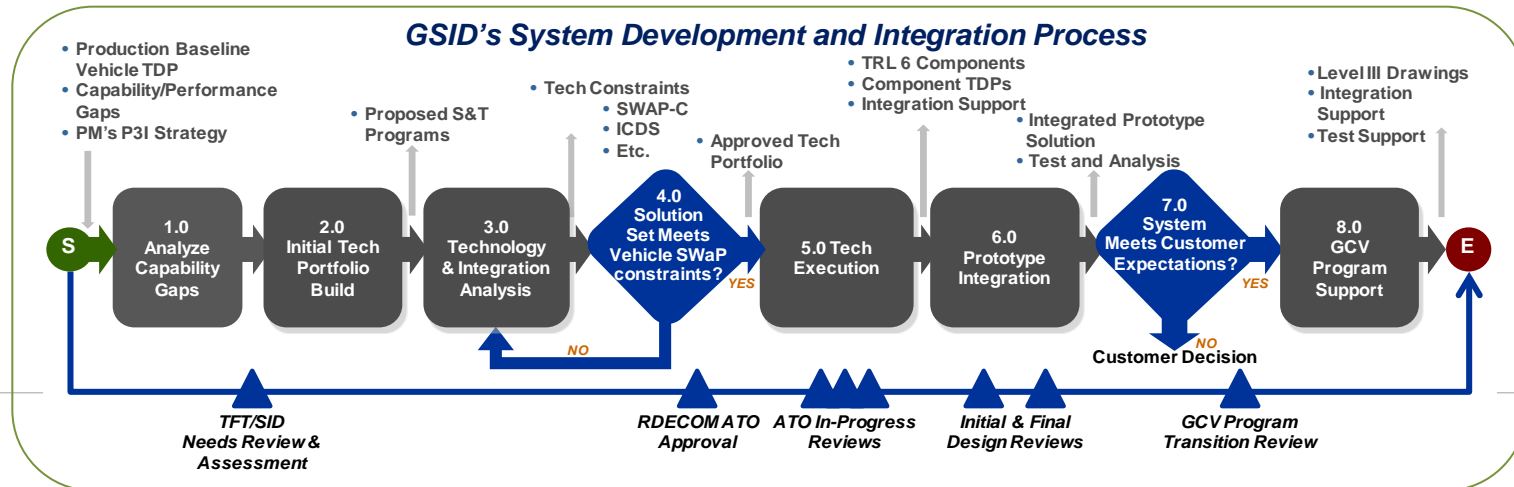
- Selected contractor prototype and production vehicles are delivered to RDECOM after testing.
- Vehicle become baseline for future planned ECPs and upgrades.
- Future portfolio alignments activities will focus tech development toward selected GCV's capability gaps

- Deliver selected contractor prototype w/ supporting tech data to RDECOM
- Deliver production vehicle w/ supporting tech data to RDECOM
- GCV S&T Portfolio Alignment
- Implement GSID's System Development and Integration Process (See Below)

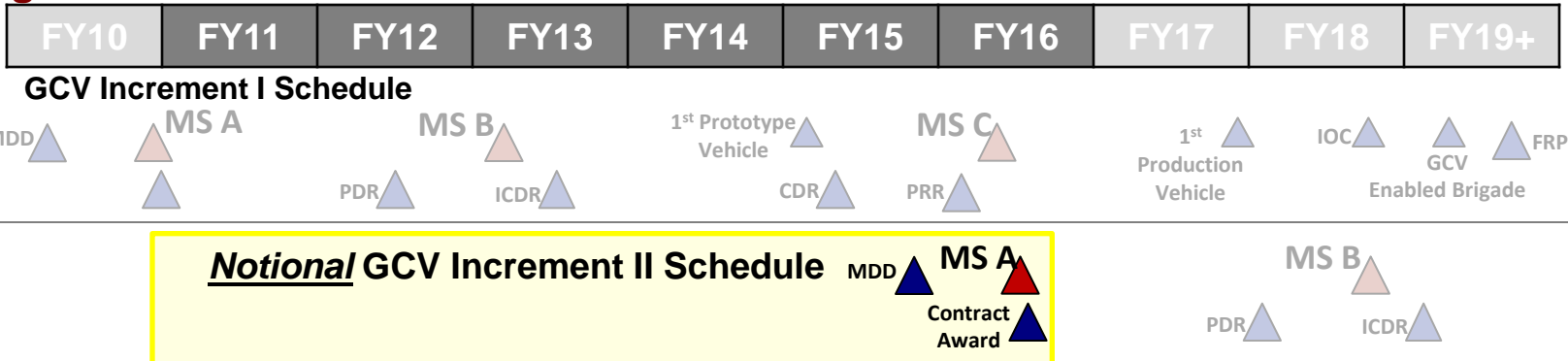
### Focused Tech Development for Production GCV



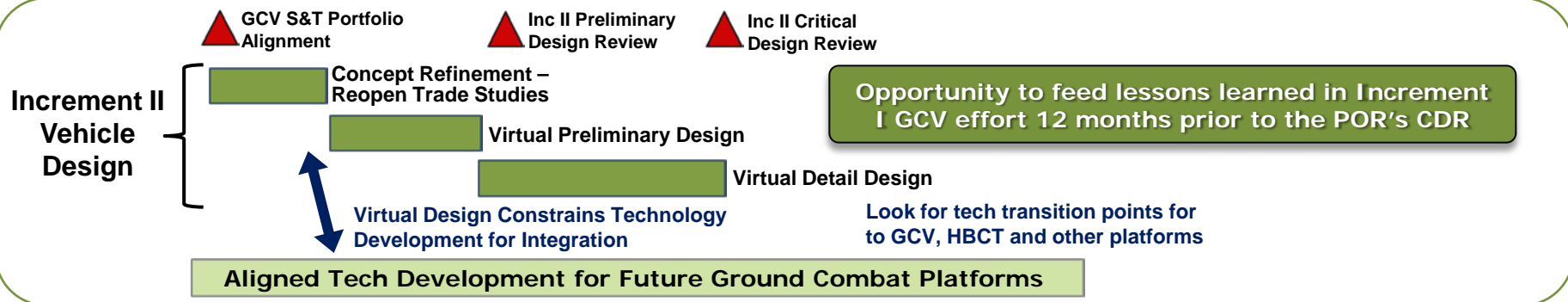
### GSID's System Development and Integration Process



## GCV Program Schedule



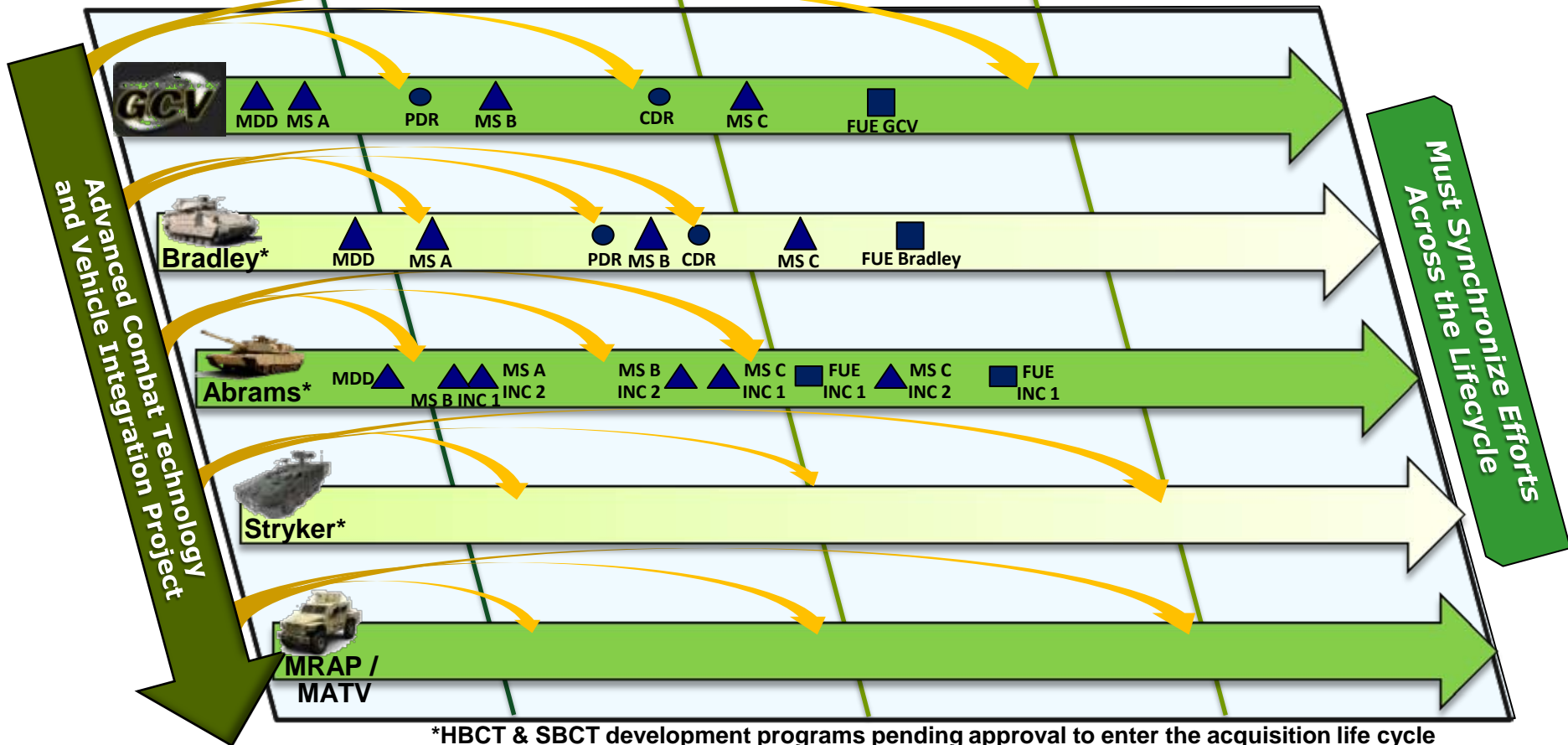
RDECOM is preparing for the next increment of GCV by creating vehicle designs focused on integrating the next-generation of technologies for enhanced capabilities



**Advanced Combat Technology and Vehicle Integration Project**

- Develop Organic Vehicle System Development Expertise within RDECOM
- Will Teach RDECOM how to Task Organize to take a System from Concept to Detailed Design
- Build the Processes Required to Manage a Concept Vehicle Build Program
- Opportunity to Determine Feasibility and Shape GCV CDD Objective Requirements Prior to MS B

FY10 Pres Bud      FY11-15 Pres Pom Years      FY16-24 The EPP Years      Beyond the EPP

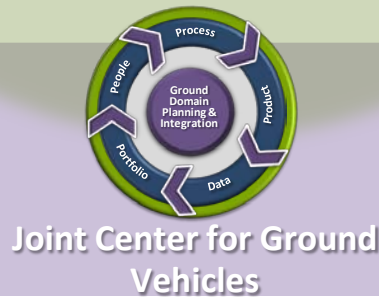


\*HBCT & SBCT development programs pending approval to enter the acquisition life cycle

Development Supports Technology Insertion (TI) Across the Fleet

**Enterprise Approach Provides Strategic Flexibility**

**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**



## Continuous Integration Evolution

- Technical Expertise
- Processes
- Data
- Products

## Building a Better Way to Deliver Capability to our Soldiers